



KOCH REMEDIATION & ENVIRONMENTAL SERVICES, LLC

October 21, 2013

Mr. Steve Bainbridge, PE
Contaminated Sites Program Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response – Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501

RE: ADEC's Review of FHRA's Alternate Water Solutions Management Plan

Dear Mr. Bainbridge:

Flint Hills Resources Alaska (FHRA) has reviewed the Alaska Department of Environmental Conservation's (ADEC's) comments, dated August 19, 2013, on FHRA's Alternate Water Solutions (AWS) Management Plan, which was submitted to ADEC on July 31, 2013. The AWS program has provided and continues to provide a safe alternative drinking water source for the part of the community near the North Pole Refinery that has been affected by sulfolane in groundwater.

FHRA has provided responses (in italics below each numbered ADEC comment) to ADEC's comments 1 through 6 as presented in your letter dated August 19, 2013. The ADEC's comment matrix on the AWS Management Plan has been updated to include FHRA's responses and is attached for your review.

- 1. Locations of alternative water systems:** Because this is a management plan, it must include information on the properties that contain a system that needs to be managed. Therefore, a list of all the addresses and lot numbers where alternate water supplies are in place must be included. This list does not need to include names but it must include street addresses and lot numbers. The list must be updated annually documenting where property transfers has occurred as well as identifying newly developed properties.

To provide information on the properties that contain a system that needs to be managed, FHRA will provide an annual list of locations, defined by latitude and longitude coordinates (and the Private Well ID numbers recently introduced to reports and the database), along with the type of solution and if there was a known property transaction that occurred at that property or if it was newly developed.

ADEC has already acknowledged that property owner's names do not need to be provided and we are concerned that the remainder of ADEC's request to provide property address information infringes on the agreements and wishes that the majority of the community have expressed

directly to FHRA to keep their personal information private. ADEC also previously agreed with FHRA in prior discussions that latitude and longitude information, combined with the provision of access to electronic data from a database containing the distribution of private well data, is sufficient to meet ADEC data requirements. FHRA has already expended significant efforts to provide ADEC latitude and longitude and database access, which we believe are adequate for ADEC to effectively understand and monitor where drinking water solutions and protections are in place.

2. **Annual report to DEC:** A report summarizing the performance of all the systems must be submitted every year. This report must adequately document and verify the provision of alternative water supplies or treatment systems for all adversely impacted drinking wells. It shall include, at a minimum, the following:
- A summary of the type of alternative water supply or treatment system provided for any new impacted well, including a figure showing the overall affected and the new remedies in place. This shall be an annual update to item 1 listed above.
 - The current and historical concentration data for each well (raw water) that has an alternate water supply.
 - The prior calendar year's performance and monitoring data on the point-of-entry treatment systems.
 - A specific section and discussion highlighting any wells for which the owner declines to be tested or monitored or refuses an alternative water supply or treatment system for that particular year.
 - An inventory of all commercial systems and commercial greenhouses with sulfolane concentrations of impacted wells, and a summary of post treatment concentrations, if applicable.
 - The sample results from the City of North Pole's supply wells for the prior calendar year.

FHRA is in agreement with preparing an annual report and, therefore, will submit an annual report that meets the criteria outlined in Section 7.0 of the AWS plan. FHRA also will continue to provide current and historical raw water data for homes that have a POE system. As previously described to ADEC, properties with bottled water or bulk water solutions are not sampled. As noted below, properties where an AWS solution was declined will be identified in the annual report.

3. **Annual report to each affected property owner:** An annual report must be sent to each property owner summarizing the results of the activities completed on their property during the previous year including the sample results of all samples collected from their property, a summary of their water usage and any other maintenance activities completed during that time.

FHRA notes that this information has previously been offered to the affected property owners during the AWS orientation meetings and the majority of the community has declined to receive this information and/or has been notified as to how to obtain this information through the FHRA GW management office. FHRA also continues to be completely willing to provide this information on an as-requested-basis for each affected owner. Homeowners will be reminded in the annual newsletter that their individual sampling data is readily available and that they can contact the Groundwater Office in multiple ways if they are interested in receiving the information or if they have follow-up questions.

Please note that, as described in Response #2, the only samples routinely collected from private wells are locations where a POE system is installed.

Finally, FHRA questions the value of individually notifying people of the volume of water that was treated or provided via private water sources since this information is provided if the property owner exceeds their allotted water provision volume. There is also no need for individual maintenance reports as access for such maintenance events would have to be granted prior to performing the work, making the report duplicative.

Therefore, when considering both environmental sustainability and the best use of resources FHRA believes that the above steps provide a practical approach to allowing the community access to information of potential interest as noted by ADEC and that this process is a better solution than the individual annual reports requested above by ADEC.

4. **Locations of properties that have not been contacted or have refused an alternate drinking water supply:** Provide a list of the properties that have not been contacted or that have refused an alternate drinking water supply. This list must be provided every year with any applicable updates.

This information will be provided annually.

5. **Point of entry system validation:** The POE management plan must be validated with the empirical data from the 155 POE systems installed to date instead of the bench scale study and the pilot test. See item #2 in the comment matrix for more details on this requirement.

We do not understand ADEC's request for new validation information. FHRA maintains a database of the raw and treated water results on an ongoing basis and has provided this information to ADEC and will continue to do so. FHRA believes the data collected to date: over 12 million gallons of water treated since 2011 with no effluent detections, is a reasonable

validation process to continue. FHRA plans to continue to maintain the Water Quality Associations' certification of the POE systems.

6. **Process to keep track of property transfers:** While the process to identify new developments is somewhat simpler, property transfers are not adequately followed by FHR. DEC requests that a robust mechanism for documenting property transfers is developed and included in the AWS. DEC has reviewed the FHR / property owner agreements for the alternate water supplies and has concluded that transfer of the Agreement is not automatic when a house is sold. Rather it is up to the owner/seller to assign the Agreement to the buyer. If the owner/seller does not choose to assign the Agreement, upon receipt by FHR of written notice from the owner that the Agreement is not being assigned, then the Agreement would terminate. There is no requirement that the buyer be told of the Agreement, so the buyer may never even know the Agreement has been terminated upon the sale. The Agreement also states that the parties to the Agreement agree they do not intend to file the Agreement in the public land records, so the buyer might never find out that there was an Agreement. While the Agreement does state that the Owner/seller is to timely notify FHR of any such assignment (to the buyer), nothing assures this will always happen, thus leaving a "hole" in the property transfer part of the management plan.

FHRA outlined in Section 2.4 of the draft AWS plan the process being implemented to monitor for property transactions and to provide outreach/education opportunities to realtors to keep them informed on the groundwater project and AWS program. As added protection during property transfers, under Alaska real estate law, disclosure of environmental issues is required and as such realtors and financial institutions have a full understanding of these requirements. FHRA has also been routinely involved in discussions related to disclosure of the sulfolane issues and, based on feedback from the community and real estate professionals, our viewpoint is that this risk is currently mitigated using the above efforts. Going forward, FHRA will provide an informational reminder regarding the disclosure obligations associated with property transfers in its annual community AWS newsletter.

When considering all of the above measures, FHRA believes that these actions meet a reasonable standard of care to mitigate the property transaction concerns that ADEC identified.

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Attached to this correspondence are FHRA's responses to the comment matrix that ADEC included in its August 19, 2013 comments on the AWS Management Plan.

FHRA is prepared to implement the changes noted above and in the attached matrix upon receipt of ADEC's approval. In the interim, FHRA will continue to operate the AWS program to meet the community's needs and expectations.

Sincerely,



David A. Smith
Koch Remediation & Environmental Services, LLC

Attachment – Responses to ADEC's 8/19/13 Comment Matrix

cc: Mr. Loren Garner – FHRA

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AWS Letter and Comments - From ADEC 19 August 2013

No.	Section	Reference	Comment	Response to Comments
Note: It is apparent that the comments provided pertain to the draft Alternative Water Solutions Program-Management Plan submitted July 15, 2013. Please note a final Alternative Water Solutions Program-Management Plan was submitted on July 31, 2013 and many of those changes already addressed some of ADEC's comments below and also is the document that FHRA will be revising if indicated below in our comments. Some modifications were made to the format of the final version, and clarifications are provided for applicable comments.				
Comments from the attached Comment Matrix:				
1	General	Document organization	The document should be organized as an Alternate Water Supplies Management Plan that includes (1) the procedure to identify a system need, (2) installation, (3) operation, and (4) maintenance of the alternate water supply systems.	The AWS Management Plan as currently drafted, includes the four requests of this comment. FHRA is concerned that, while the reorganization suggested in this comment may streamline the report for the Contaminated Sites Program, it would override the materials that have been developed cooperatively with the Drinking Water Program. In particular, Appendix B is the POE system report required by ADEC's Drinking Water Program, and includes several different modules/attachments for different users, with some repetitive requirements. This report also documents the technology selection and development of the POE treatment system implementation. The current structure addresses the proposed topics without creating the need for separate but competing versions of the same information to satisfy two different programs. Therefore, FHRA believes the better and more efficient route is to retain the present structure; however, FHRA is willing to discuss with stakeholders other formatting options.
2	General	Attachment B	<p>As a follow up to comment 1, Attachment B should be a POE Management Plan rather than a discussion of the feasibility testing and subsequent design. This plan should include, but not be limited to, the following items:</p> <ul style="list-style-type: none"> • a validation of POE performance based on empirical data from the 155 POE systems installed to date (as described in cover letter); • a sampling and analysis plan centered on verification of acceptable performance of the system; • an O&M plan that conforms to the WQA certification details and incorporates the SOPs; • the waste management plan; and • an annual performance monitoring reporting plan for the POE systems (as described in cover letter). 	See response to comment #1.
3	General	Attachment B	Information from the bench and pilot tests could be provided in an appendix to the overall document to provide a background for the process of testing and developing the current POE system design and certification by the WQA.	See response to comment #1.

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No.	Section	Reference	Comment	Response to Comments
4	General		The overall program plan should detail an annual status update on all properties in the AWS program, and those properties that have opted out of the AWS program. This report should include new participants in the program as a result of program expansion, property development, or property transfers as described in cover letter.	Please refer to FHRA's letter responses to ADEC's comments 1 through 6
5	2.1.1	"sulfolane moving into wells within a few years"	Please clarify if this applies to all buffer zone properties and how this was determined.	Yes, this statement applies to all buffer zone properties. Buffer zone properties are evaluated annually based on results at monitoring wells and residential wells and professional judgment as described in Section 2.1.2. Note: FHRA modified the text of this section in the final report submitted on July 31, 2013
6	2.1.3	"general plume area"	Define "general plume area"	The general plume area definition is based on the furthest extent with detectable sulfolane levels. Please note that, within the general plume, there may be locations without detectable levels.
7	2.1.3		Provide a list of the properties that have declined a long term AWS	As we described in the FHRA's letter responses to ADEC's comments 1 through 6, FHRA intends to provide this information in the annual report. If ADEC requires this information sooner, please notify FHRA.
8	2.2.1.2		Provide a list of locations that have not been sampled	FHRA intends to provide this information in the annual report. If ADEC requires this information sooner, please notify FHRA.
9	2.4		Has Flint Hills attempted to work with the FNSB to be notified when new construction permits are requested?	FHRA has contacted FNSB and was informed they do not issue construction permits.
10	3.2	"Plume footprint"	Please define.	Plume footprint has the same definition as the "general plume area". See response to comment #6.
11	3.2.1		Why is the homeowner supplied the property deed during the meeting?	To confirm who is the property owner.
12	3.2.2		Provide a list of the residents that opted for the 4th option.	ADEC has been notified that the fourth option is no longer an option and FHRA is working with residents who selected this option to convert to FHRA-supplied bulk water. These locations will be included as participants in the annual report.
13	3.2.2		Discuss the original water options available and how many were installed (include city water and the 4th option)	FHRA initially provided bottled water to impacted residents. City water was also extended to those in the Ford subdivision. The other options made available to those outside the city service area are described in Section 3.2.2. The number of residents with each AWS solution will be included in the annual report.
14	3.2.2.1	"Sulfolane is removed from the water and is adsorbed to the GAC"	This statement is misleading since the mechanism by which sulfolane is removed with the GAC is unknown. Please clarify.	FHRA does not agree this is a misleading statement; however, this statement will be clarified.
15	3.2.2.4		Who is eligible for the garden tank alternative?	All property owners outside the city water system and with detectable sulfolane levels.
16	3.2.3	4th bullet: "interim action cleanup level"	This is an incorrect statement. 14ppb is the final site specific or alternative cleanup level. Please correct.	Statement will be revised. Please note this is subject to the limitations provided by FHRA in a letter to ADEC dated August 20, 2012.

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No.	Section	Reference	Comment	Response to Comments
17	3.2.3		How many sampling events below 14ppb will trigger expiration of the contract?	As noted in Section 8.0, this has not been determined yet.
18	3.2.3		If a property transfer occurs for one of the properties that elected the 4th option, how does Flint Hills keep track of this transfer and informs the new home owner?	ADEC has been notified that the fourth option is no longer available and that FHRA is converting existing owners that previously selected this option to FHRA-supplied bulk water. Property transfers will be managed as discussed in FHRA's letter response to ADEC's comments 1 through 6.
19	3.3		List additional requirements for commercial properties.	The ADEC Drinking Water Program reviews commercial properties and determines applicable requirements and/or permits.
20	5.3	"Water deliveries for bulk tanks are currently provided by local suppliers hired by FHRA"	This statement is incorrect since there are residents that elected the 4th option that are not currently receiving water by local suppliers hired by FHRA.	The context of the statement was referring to the Option where FHRA is providing bulkwater, and for this option, it is provided through hired contractors, which is correct. Per the response to #18; the AWS program is being modified to move homeowners who previously accepted the 4th option over to FHRA-supplied bulkwater.
21	5.4		How does Flint Hills keep track of property transfers?	Section 2.4 outlines a process implemented to monitor for property transactions. Please refer to FHRA's letter response to ADEC's comment #6.
22	Attachment B 5.1	"activated carbon absorption..."	This is an incorrect statement. It is not known how the sulfolane is removed by the GAC system.	See comment #14.
23	Attachment B 5.4	"soil absorption system"	Describe what is a soil absorption system.	It is a drainfield system installed if the existing sewer system is failing or if it is unable to handle the flowrate, or if it is too far away to be reasonably accessed. The systems are installed in accordance with ADEC WasteWater Division Guidelines. Clarification and additional description will be added to the text.
24	Attachment B 6.1		What is the range of concentrations for selection of a simplex system or a duplex system?	The simplex versus duplex decision is not based solely on concentration and includes water usage and space available. Considering these factors, the system is selected based on a reasonable changeout frequency utilizing the WQA certification guidelines.
25	Attachment B 6.1.3		Please indicate that no sampling has been conducted to date.	Given that some sampling and analysis has occurred or is underway, we do not believe this comment is accurate.
26	Attachment I of B 3.1	"Ideally, duplicate samples will be collected from POE treatment system sample port A with detectable historical data for the target analyte"	Are there any POE's installed where there were no detections present?	Yes, one POE system has been installed in a location where results are below detection limits. The system was installed because surrounding locations have detections. All other POE systems were installed based on an initial detection. However, there are several cases where there were initial detections that are currently non-detect; the POE systems continue to be maintained at those locations. Note: Attachment I was moved to Attachment G in the final version submitted July 31, 2013.
27		"Results of the analysis from this duplicate will be used as a check for repeatability in the analytical procedures"	It is also a check for repeatability in the sampling technique.	Acknowledged

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28	Attachment I of B/3.2		Why is the sample selected for MS/MSDs analysis the one from port D?	The MS/MSDs analysis should be completed on raw water samples collected from port A. The text in Section 3.2 will be updated to reflect this edit.
29	Attachment I of B/3.4		Add a reference to Table 1 in this section.	Reference to Table 1 will be added to Section 3.4.
30	Attachment I of B/4.2		Where is the AHL facility located at?	The AHL warehouse facility where the GAC is stored and the tanks filled/maintained is at 3651 Royal Road, Fairbanks.
31	Attachment I of B/4.4		What are the "applicable laws for sediment filter management"? What is the offsite facility?	The text will be revised to described the applicable laws. The offsite location is the AHL warehouse listed above.
32	Attachment I of B/5.3		Changes in the general condition of the system should also be noted including odors, noises, or other complaints.	Acknowledged.
33	Attachment I of B/7.3		Please submit a plan for correcting repetitive high reporting limits.	A plan will be included in revised text.
34	Attachment I of B / General		Include a plan for distributing sampling results to each homeowner. This should be part of the reporting requirement listed in comment 4 and described in the cover letter.	Please refer to FHRA's letter responses to ADEC's comments 1 through 6
35	Attachment J of B /2.4	"12-24 month changeout"	How is the exact amount of time determined?	The redundant vessel changeout is completed while technicians are onsite servicing other equipment, which is based on water usage. This minimizes disturbances to homeowners. Thus, the exact timing will vary based on water usage. Note: Attachment J was moved to Attachment E in the final version submitted July 31, 2013.
36	Attachment J of B/2.4		Describe the backwash process, where does the backwash water go?	The backwash is routed to the residential septic system or soil absorption system.
37	Attachment J of B /3.0	"After treatment is complete, any residual material accumulated in the bag house filters will be collected for post treatment characterization, and will be disposed at an ADEC approved facility"	Please indicate what facility the material goes to.	As stated in the Spent Carbon Management Plan, the residual material after incineration is disposed at the FNSB Landfill.
38	Attachment D of J of B (Revised Spent Carbon Management Plan)	General	Please provide the current statistics on carbon usage and sampling.	FHRA will need further clarification of ADEC's request, and then the requested information can be provided if available.

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39	Attachment D of J of B (Revised Spent Carbon Management Plan) /3.2	In home water treatment system characterization	What is the sampling frequency of the spent carbon from the in-home water treatment system?	The current procedure is to collect a minimum of two composite characterization samples per 50 cubic yards generated. The Spent Carbon Management Plan will be revised to reflect this.
40	Attachment D of J of B (Revised Spent Carbon Management Plan) / 5.0	Post -treatment Characterization	How many post treatment samples are collected by volume?	Two composite characterization samples will be collected from the first 50 cubic yards of material. A third sample will be collected if there are more than 50 cubic yards of material.
41	2.1.2	Buffer Zone	A graphic showing the pattern of annual review and resulting adjustments to the buffer zone from the start of the AWS program implementation in 2009 should be included.	FHRA can provide maps of the buffer zones delineated in 2012 and 2013 in Section 2.1.2, which is the time period when the buffer zone process was implemented.
42	3.2.2.1		Sample collection between additional water treatment stages (UV, sediment filter, water softener) could provide information on sulfolane treatment. For example, adding sample collection before and after the water softener could provide information on sulfolane reduction across the filters and through the water softener. Analogous sulfolane reductions have been observed across sand filters and the gallery pond in the onsite remediation system.	FHRA believes that the current monitoring locations are adequate and protective to monitor operation of the system.
43	Attachment B, 5.1		Statements about 2.5 cf GAC vessel lasting 2-3 months is misleading. Scale up calculations in Attachment D may suggest this (despite heading/calculation errors), but the accelerated pilot test trials, the in-home pilot testing at location A, and WQA certification (replacement component service cycle) all indicate 10,000 gallons at ~300 ppb sulfolane concentration is the appropriate life cycle for a 2.5 cf GAC vessel. The 10,000 gallon treatment volume correlates to ~42 days at normal household use of 240 gallons/day, not the 2-3 months suggested in text of Section 5.1. Please revise the text to clarify that POE Systems are being operated in accordance with WQA certification as detailed in the Operation and Maintenance Manual(Att. J of Att. B).	FHRA does not believe the text is misleading, but the comment is acknowledged. The POE systems are being operated in accordance with the WQA certification with changeout frequency determined based on water usage and sulfolane concentration. Additionally, it should also be noted that the actual water usage is typically significantly lower than 240 gallons/day.

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No.	Section	Reference	Comment	Response to Comments
44	Attachment B, 5.3		Similar to misleading statements in previous comment, pilot tests of POE systems suggest lower breakthrough volumes and thus lower factors of safety than text in section 5.3 which are based on bench scale testing. Factors of safety for the POE systems are a result of duplex GAC vessels and redundant GAC vessels for systems with ~300 ppb feed water. Please revise the text to clarify that POE Systems are being operated in accordance with WOA certification as detailed in the Operation and Maintenance Manual (Att. J of Att. B).	See response to comment #43.
45	Attachment B, 5.3		GAC Backwash / Water Softener Backwashing of the GAC vessels and regeneration of the water softener has the potential to discharge over 1,000 gallons/month of groundwater exceeding sulfolane cleanup levels to leach fields. These discharges can be from deep wells to vadose zone soil that is not impacted with sulfolane. It is recommended that these discharges be tested to understand these waste streams.	This backwash water has been discussed with ADEC in detail, particularly in reference to the soil absorption systems. As such, FHRA does not believe the operation of these backwash systems poses an identifiable threat or risk that warrants further study, nor would further study lead to different outcome for system operations.
46	Attachment B, SVOC SOP	Standard Operating Procedure for Routine Level SVOC and PAH Data Validation	The <i>Standard Operating Procedure for Routine Level SVOC and PAH Data Validation</i> references a Wisconsin Method for diesel-range organic compounds (ORO). The SOP is not applicable for validating ORO analysis run by AK Method 102. ORO is not however a constituent of concern at the FHR site. A new SOP will have to be developed I referenced if ORO ever becomes a concern on this project.	This SOP was utilized during the period of bench testing. Ongoing analytical monitoring follows the current Residential Sampling and Analysis Plan (RSAP). Future reports will reference the current RSAP.
47	Attachment B, SVOC SOP	Table 2 - Guidance for the Evaluation of Blank Contamination.	The line items for evaluating "All target parameters" for SVOCs when detected in the method blank should state concentration <5x and >5x blank contamination, not <20x and >20x.	This SOP was utilized during the period of bench testing. Ongoing analytical monitoring follows the current Residential Sampling and Analysis Plan (RSAP). Future reports will reference the current RSAP.
48	Attachment B, SVOC SOP	Section V. Field Duplicate	Section V states RPDs for waters are typically <20-30% and soils are <30%-40%. ADEC laboratory checklist recommends <30% for waters and <50% for soils.	This SOP was utilized during the period of bench testing. Ongoing analytical monitoring follows the current Residential Sampling and Analysis Plan (RSAP). Future reports will reference the current RSAP.
49	Attachment B, SVOC SOP	Table 6	Missing foot note describing superscript definitions.	This SOP was utilized during the period of bench testing. Ongoing analytical monitoring follows the current Residential Sampling and Analysis Plan (RSAP). Future reports will reference the current RSAP.